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(54) A valve housing arrangement

(57) The invention relates to a synthetic resin block-like integral housing subassembly (6) constituting a set of valve housings (8). The subassembly has sockets (10) for valve components such as valve seats, valve members etc, a feed duct (13) and controlled fluid ducts (22 and 23). The ducts (22, 23 and 13) extend through the subassembly (6) and open at one end into the sockets (10) and at the other end at orifices (26, 27 and 16) communicating with the atmosphere. At least some of the orifices (26 and 27) of the controlled fluid ducts (22 and 23) are placed on a common side (24) of the housing subassembly (6), on which there is a metal connection plate (30) having connection holes (32) aligned coaxially with the separate orifices (26 and 27).

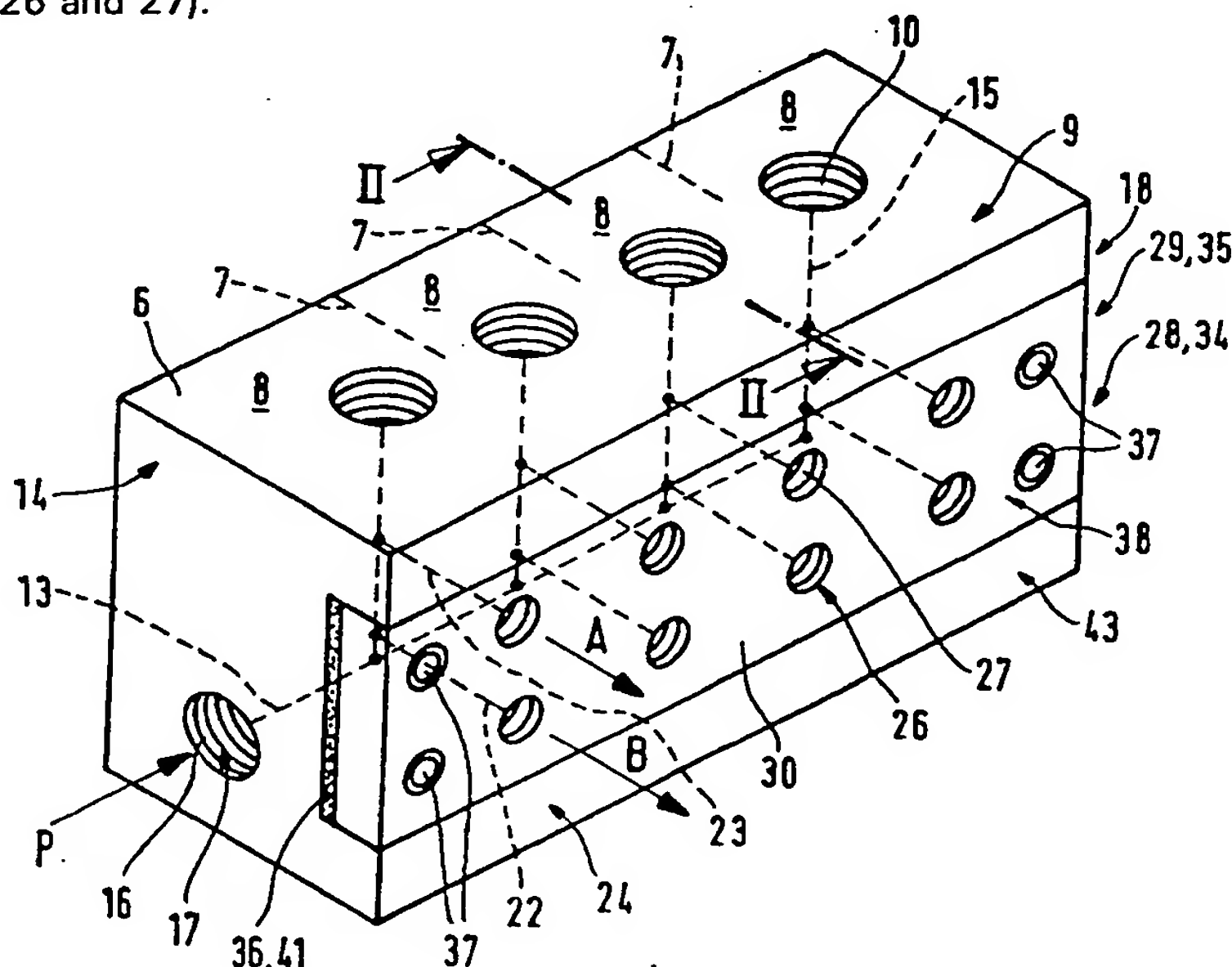


Fig.1

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

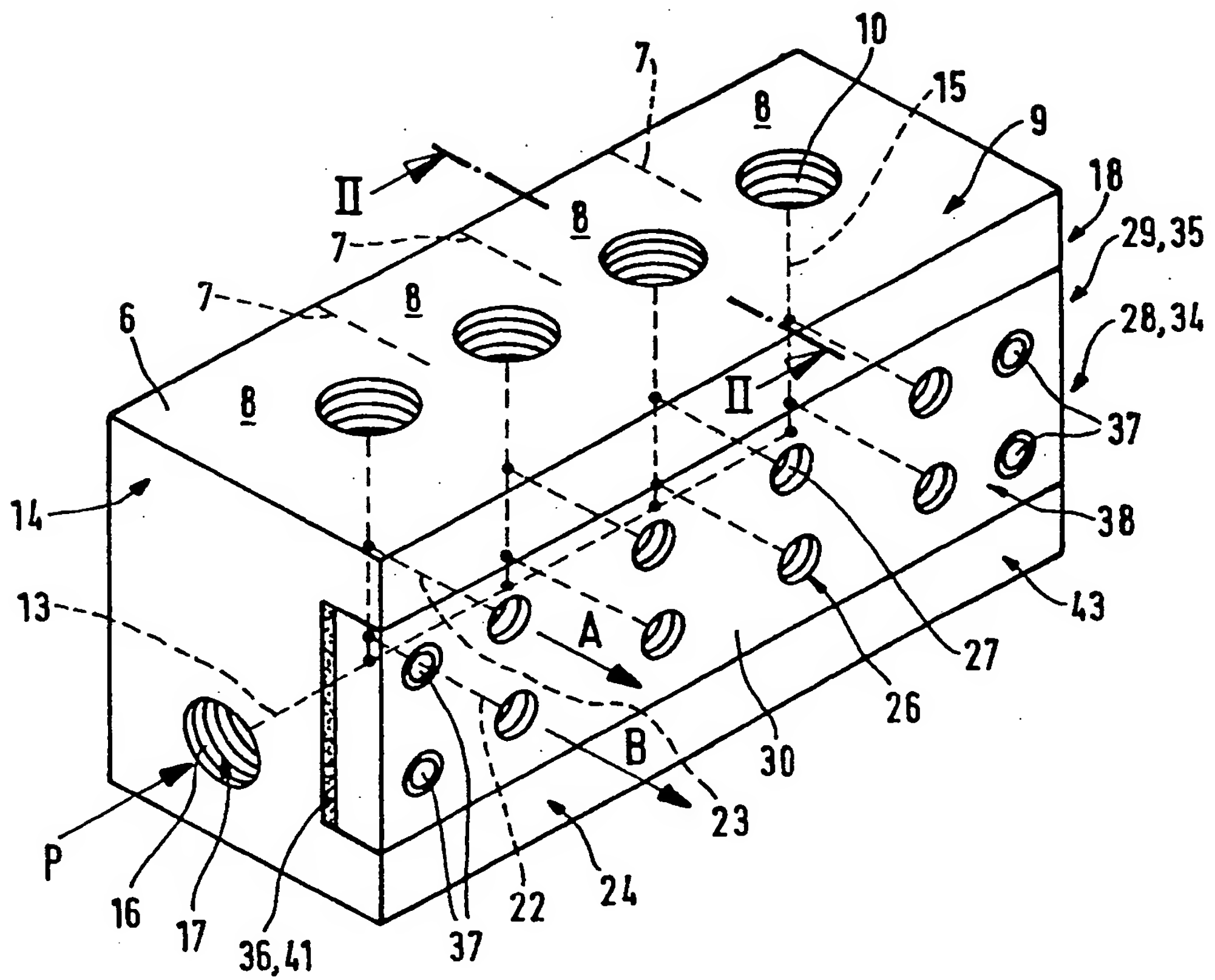


Fig.1

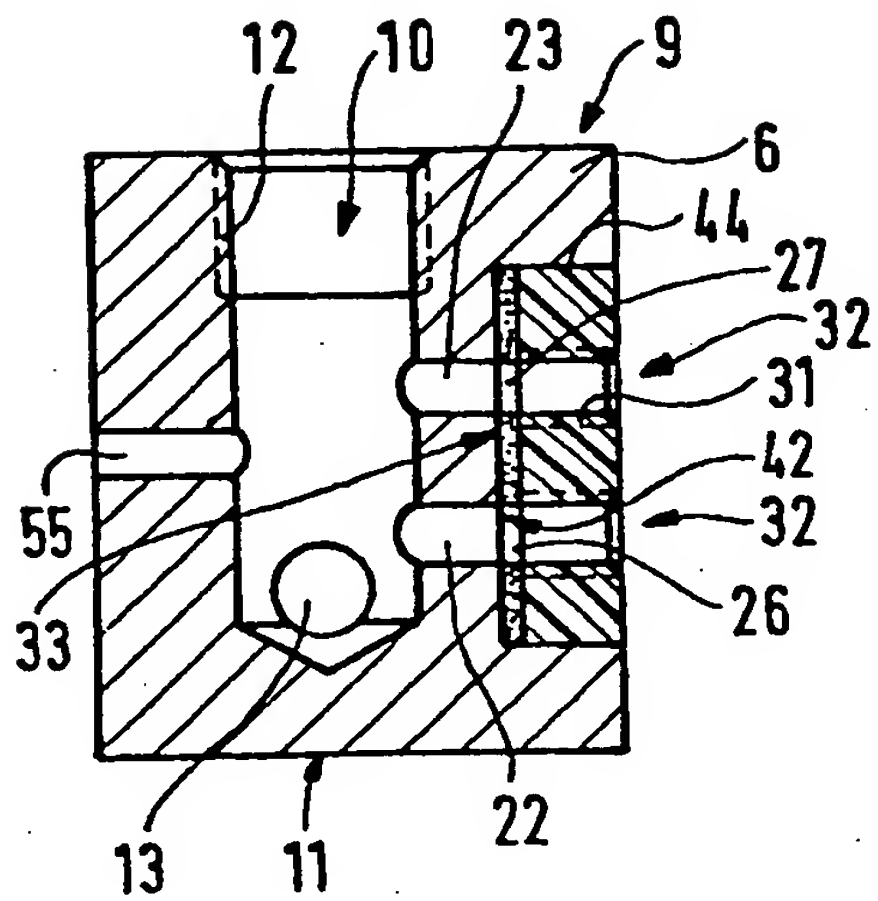


Fig. 2

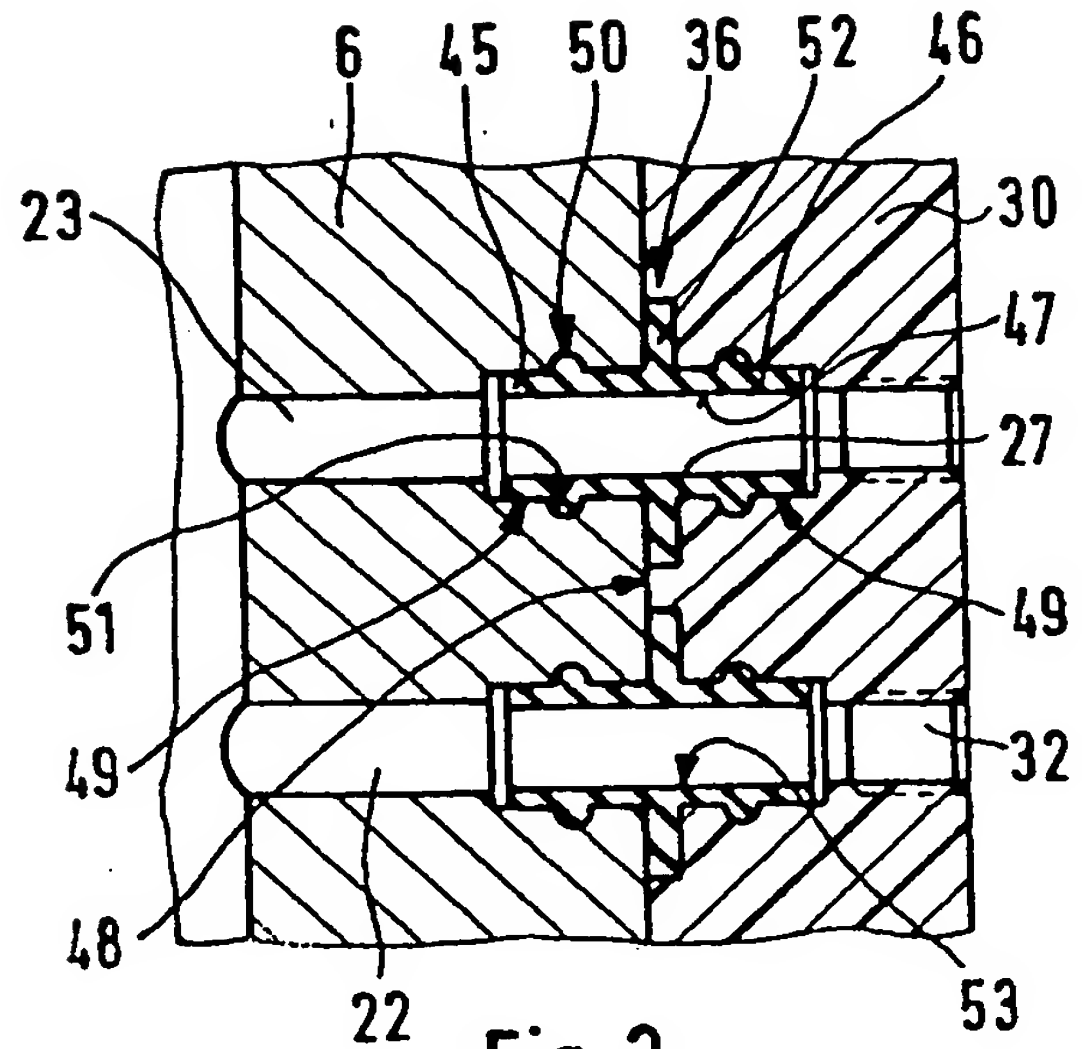


Fig. 3

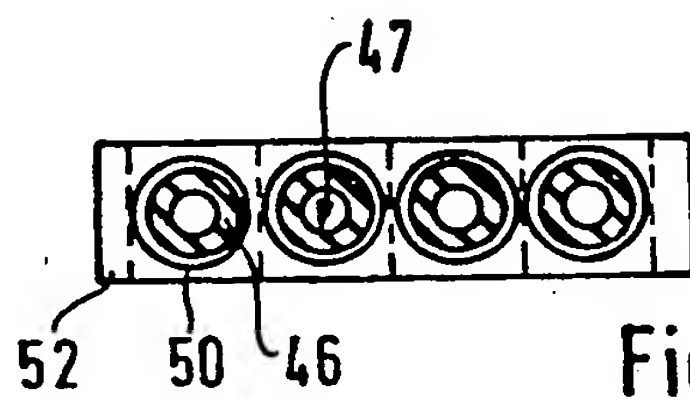


Fig. 4

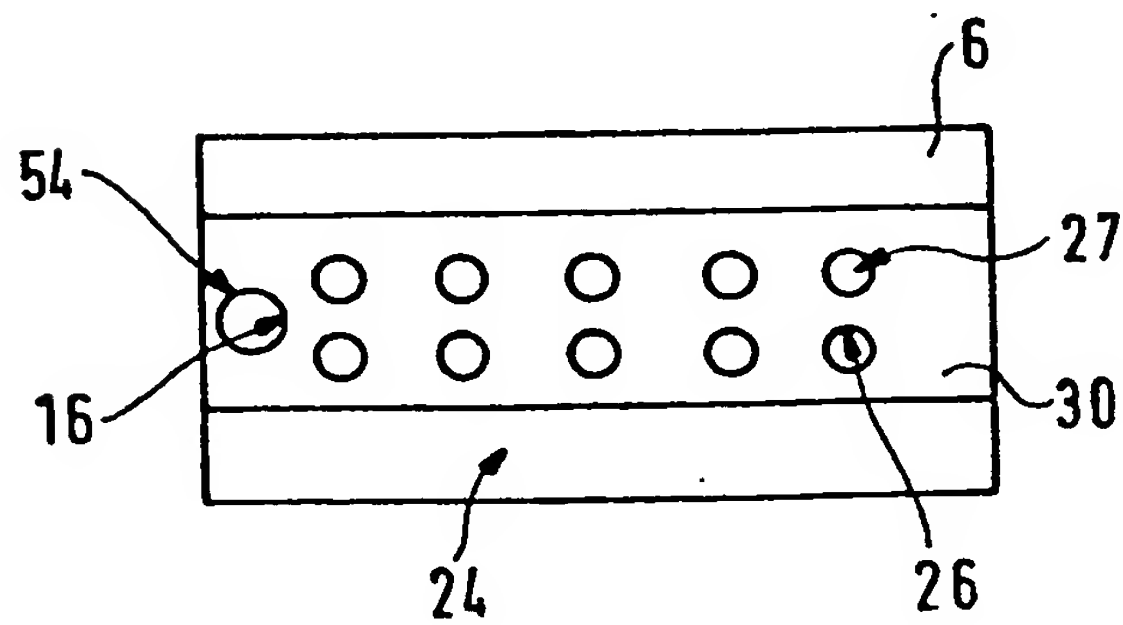


Fig. 5

SPECIFICATION

A valve housing arrangement

5 The invention relates to valve housing arrangements more particularly of the type in which the valve housings are combined together as a functional assembly.

10 In hydraulic or pneumatic devices or in devices which have fluid operated components, it is preferred for the greater part of the control members, more especially in the form of valves, to be concentrated together at a single location. This ensures a synoptic arrangement that may be readily accessed, as may be
15 more especially relevant for any necessary check of functions and servicing operations, which are accordingly facilitated. At the same time such a central concentration of the components may well be adopted for maximum compactness of the valve arrangement. The consequence of this is that as a rule a set of valves of the same design will be concentrated as separate component sub-assemblies.
20 In this case in each such subassembly the valves will have identical valve housings, which are arranged in rows adjacent to each other with their feed duct exit orifices connected with a common manifold in order to reduce the number of leads. Despite this simplification of the terminals for the power fluid such arrangements of valve housings are relatively costly, seeing that the valve housings made of metal have to be separately produced
35 and machined. This demands a large number of working steps involving chucking and checking. Furthermore, the assembly of the above arrangement of a set of valve housings is slow, since each individual housing has to be mounted separately at the appropriate location therefor. Such a conventional array is therefore expensive as regards its production and assembly.

45 One object of the present invention is to create a valve housing array of the initially specified type which is compact.

A further aim of the invention is to devise such an array that may be cheaply produced in only a few operations.

50 A still further objective of the invention is to devise such an array or arrangement that may be quickly mounted or assembled at the application site.

55 In order to achieve these or other objects appearing during the course of the ensuing specification a housing arrangement comprises a set of valve housings connected together as a functional unit, each housing having a socket for at least one valve component, a feed duct and at least one controlled fluid duct for fluid whose flow is to be controlled in said housing, such ducts extending at least partly through the respective valve housing and opening into at least one of such sockets and
65 having an orifice in an outer face of the ar-

70 rangement for connection with external means, said valve housing being made of synthetic resin with the set of housings combined together as a block-like housing subassembly with at least some of the orifices of the said controlled fluid ducts being arranged on a common side of said subassembly, same further including a metal connection plate extending over said common side and having tapped connection orifices coaxially aligned with said duct orifices in said common side. It is an advantage that the array in accordance with the invention may be produced with a relatively small number of working steps, it being
75 preferred for the housing block to be cast and then bored to produce the necessary ducts therein.

80 However it is also possible for the ducts to be produced by casting in a suitable casting mold. The operations for machining the outer faces are greatly reduced in the case of the housing subassembly in accordance with the invention, since it is a question of a single component representing a plurality of valve housings. Furthermore the assembly of the housing subassembly may be carried out in a short space of time; the assembly of a single component practically involves the assembly of a number of valve housings. Nevertheless
85 the array of the invention has a small overall size, since the separate valve housings may be placed side by side in a sequence. Furthermore, there is a substantial saving in weight. Owing to the fitting of the metal connection plate with tapped holes, it is furthermore possible to ensure that if threads for the ducts carrying driving fluid are screwed on and unscrewed a number of times there will be good reason for expecting that stripping or other
90 damage to the threads will be unlikely, since the threads are very robust and as sturdy as connection threads provided on metal valve housings.

100 Useful developments of the arrangement of valve housings in accordance with invention are defined in the claims.

110 In keeping with one such further development of the invention a metal tapped bushing is mounted in the preferably single feed duct orifice of the feed duct connected with all sockets.

115 In this form of the invention the array has a single feed duct leading to all the sockets so that it is only necessary to have a single, central feed duct orifice. Accordingly the assembly time for the attachment of a fluid pressure duct may be considerably reduced. Despite the manufacture of the housing subassembly of synthetic resin the insertion of the
120 tapped bushing makes possible a reliable and sturdy connection facility. It is furthermore possible for the single orifice for the feed duct connected with all the sockets to be placed on the housing side having the outlet orifices of the controlled fluid ducts of the housing
125
130

subassembly and for it to be covered over by the connection plate, the latter having a through connection hole placed coaxially in relation to the orifice of the feed duct. In this case it is possible to dispense with a separate tapped bushing and the connection hole may with advantage be integrated in the connection plate.

Furthermore the connection plate may be permanently attached to the housing subassembly, as for example by bonding. This serves to provide a firm connection between the connection plate and the housing subassembly, there being the added advantage that it is then possible to dispense with a gasket between the two structures. This saves costs.

In accordance with a further concept of the present invention the connection plate is detachably joined to the housing subassembly with one or more gaskets between the connection plate and the housing subassembly adjacent to the outlet orifices and connection holes that are to be joined together. The connection plate may be screwed or detachably plugged onto the housing subassembly. These further developments of the invention make it possible to replace the connection plate and it is possible to take into account the dimensions of the controlled fluid ducts by enabling connection plates to be mounted that have different diameters to their connection holes. In particular, the finishing of the connection plate may take place directly at the site of application since only the desired tapped holes have to be produced in it. The possibility of having a plug-on plate is particularly advantageous in connection with further developments of the invention in which the gasket for respective outlet orifices and connection holes placed adjacent to each other and in line has two coaxial integral rubber-elastic sealing sleeves defining a through coaxial fluid duct of which the one sleeve may be temporarily fitted into the outlet orifice and the other sleeve may be fitted into the connection hole. Furthermore each gasket sleeve may possess an annular retainer bead able to be snapped into a mating retainer groove in the wall of the respective controlled fluid duct and the respective connection hole. The gasket may be a plate with paired sleeves extending from opposite sides to fit into holes.

Furthermore the housing subassembly may have the form of a rectangular prism as for example a square prism. This form may be easily manufactured at a low price owing to its simple geometry. A further contribution to compactness is possible if the connection plate is let into one of the longitudinal sides of the housing subassembly, the two longitudinal directions being parallel to each other and the surface turned towards the outside if the connection plate terminates generally flush with the outer face of the housing outer face of the respective longitudinal side of the hous-

ing subassembly. In this form of the invention the connection plate is able to be mounted on the housing subassembly so that it is securely located in position.

In keeping with a further development of the invention, the housing subassembly is fashioned of cast resin with the connection plate embedded in it. This form of the invention is readily manufactured and ensures a permanent and reliable connection between the housing subassembly and the connection plate. The latter may be placed in the casting mold in accordance with the invention and after the end of the manufacturing operation will be surrounded by synthetic resin so that it is firmly and sealingly held in place.

The preferred metal for the connection plate is steel which is strong and relatively low in price.

A more detailed account of the invention will follow as based on the accompanying drawings.

Figure 1 is an isometric view of a first design of the array in keeping with the invention with the connection plate screwed in place on the housing subassembly.

Figure 2 is a cross section taken on the line II-II of *Fig. 1*.

Figure 3 shows a further embodiment of the invention also in a sectional view comparable with that of *Fig. 2* on a larger scale.

Figure 4 is a view from above of a gasket plate provided with sealing sleeves.

Figure 5 is a side view of the side of the housing carrying the connection plate which contains a connection orifice for the feed duct.

Figs. 1 and 2 show a first form of a housing subassembly 6 made up of a number (in the present case four) valve housings, which are integrally made. Since they are integral it is not possible to see the valve housings as separate units but however, in *Fig. 1*, broken separating lines 7 have been inserted to enable one to think of the units as being a number of sections, that is to say as four sections 8 of the housing subassembly 6 as representative of the valve housings.

The housing subassembly 6 has the form of a block and, in the present example, of a rectangular prism with a rectangular cross section, as for example a square one. In one longitudinal side of the housing subassembly 6, in the present case the upper side 9, there are sockets 10 whose axes are aligned so as to be at a right angle to the top side 9. Each housing section 8 has one such socket 10 and the holes are placed in sequence in the longitudinal direction of the housing subassembly 6 so as to form a row of holes. As shown in *Fig. 2* each socket 10 ends in well or blind hole short of the lower side 11 of the housing subassembly 6. It would also be possible to have through holes which would then have to be plugged. Each socket 10 serves to receive a valve component (not shown) such

as a valve seat, valve member, or the like; it will be clear that the sockets will have mating inner shoulders etc. for cooperating with the components, such inner faces not being

5 shown in order to make the drawing more straightforward. It is only at the top side 9 that the threads 12 will be seen which make it possible for the valve components to be
10 10 are only marked in broken lines (15) in Fig. 1 inside the housing subassembly in order to make the Fig. more straightforward).

Each of the sockets 10 communicates with a feed duct 13, which is to be connected with
15 a supply (not shown) of fluid under pressure. The array in accordance with the invention has the advantage of having a single feed duct 13 with which all the sockets 10 are connected. The feed duct 13 is drilled, starting from one
20 of the end faces 14 of the housing subassembly 6, so as to extend in the length direction thereof. That is to say, it extends in a plane which contains all the longitudinal axes of the sockets 10. It is arranged in relation to the
25 sockets 10 in such a way as to cut each of them. It may have a smaller diameter than such sockets as in the form according to Figs. 1 and 2, Fig. 2 making this clear.

A supply of fluid under pressure may be
30 connected by a fluid duct (not shown) with the feed duct orifice 16 on the end face 14. For this purpose a metal tapped bushing 17 is fitted into the feed duct 13 in its orifice 16. The bushing is fixed, as for example by bond-
35 ing, so that it cannot be twisted and the threaded male end of the fluid line may be screwed into it. The tapped bushing 17 offers the advantage of producing a strong screw thread which will remain fully operational even
40 after the male thread has been screwed into and out of it a large number of times.

The feed duct 13 ends in the interior of the housing subassembly 6 short of the end face 18 opposite to the end face 14. In this re-
45 spect the duct is preferably in the form of a blind hole, although it would also be possible to have a through hole which would then be plugged from the end face 18. This design would more particularly offer the possibility of
50 rationalizing the production of housing subassemblies with a great length and then cutting them down to the desired size.

Each socket 10 is furthermore in communication with at least one, and in the present
55 case two controlled fluid ducts 22 and 23, which extend through the housing subassembly 6 and open at one of its longitudinal sides into the atmosphere. In this respect the invention is so designed that at least some of the
60 outlet orifices of the controlled fluid ducts are arranged on the same side of the housing. It is best however if all the controlled fluid ducts 22 and 23 run to the same side of the hous-
65 side 24 of the housing adjacent to the top

side 9 and at a right angle thereto. In this respect it has turned out that there is a particular manufacturing advantage to be gained if the controlled fluid ducts 22 and 23 are so
70 arranged that they run at a right angle to the longitudinal side 24 and parallel to the end face 14. In this respect the two controlled fluid ducts 22 and 23 leading to a socket 10 of one of the portions 8 are parallel to the
75 direction of the longitudinal axis 15 of the respective socket with a spacing between them. In other words, they are superposed.

Furthermore however the power fluid ducts associated with the individual sockets 10 are
80 so arranged in relation to each other that both the controlled ducts 23 adjacent to the top side 9 and also the controlled ducts 22 adjacent to the lower side 11 are respectively contained in or aligned with a common plane
85 parallel to the top side 9 and to the lower side 11, such two planes being arranged to be parallel to each other. This means that the outlet orifices 26 and 27, respectively, of the controlled ducts 22 and 23, respectively, on
90 the longitudinal side 24 each constitute a row of orifices 28 and 29, such row extending in the longitudinal direction of the housing subassembly 6 so that the orifices 26 and 27, respectively, extend sequentially in a spaced lin-
95 ear array.

The outlet orifices 26 and 27 of each portion 8 are to be connected with loads, as for example in the form of double-acting cylinder actuators. Such connection is best by way of
100 pressure fluid lines, not shown, which are connected with the controlled ducts using screw connectors which may be undone. In accordance with the invention the housing subassembly 6 is manufactured of synthetic re-
105 sin material, this meaning that tapped holes therein would tend to have weak threads so that if a pressure fluid line were to be frequently screwed and unscrewed the thread would be damaged and the entire housing subassembly 6 would become useless in the
110 course of time. In order to prevent such a difficulty at the outset, in accordance with the invention there is a metallic connection plate 30 on the longitudinal side 24 of the housing with the outlet orifices 26 and 27, such plate
115 30 extending along the side and having through connection holes 32 which are coaxial to the respective outlet orifices and are provided with connection threads 31. The array
120 in accordance with the invention may be simply produced and preferably the housing subassembly is made of cast synthetic resin so that it only needs a few machining operations, has a low weight and nevertheless has robust
125 connection screw threads which will be virtually undamaged even after the pressure fluid line have been screwed and unscrewed may times over.

In the working example the connection plate
130 30 extends for the full length of the housing

subassembly 6. One of the plate faces 33 of the connection plate 30 is mounted on the longitudinal side 24, and the longitudinal axis of the housing assembly 6 and of the plate 30 are parallel to each other. The breadth of the connection plate 30 as measured athwart the longitudinal direction and in the direction of the longitudinal axis 15 is greater than the distance between the controlled ducts 22 and 23 of one portion 8. The connection plate 30 covers over all the outlet orifices 26 and 27. As will be readily seen from Figs. 1 and 2 the connection holes 32 in the connection plate 30 are in an arrangement corresponding to the manner of arrangement of the outlet orifices 26 and 27 on the longitudinal side 24 of the housing. There are accordingly also two rows 34 and 35 of connection holes 32 which correspond with the associated controlled ducts 22 and 23 formed in the housing.

Basically there are two possibilities as regards attachment of the connection plate 30 on the housing subassembly 6, that is to say detachably or permanently. In the latter case the connection plate 30 may for example be bonded to the longitudinal side 24 of the housing subassembly 6. This design has the advantage that it is then possible to dispense with a separate gasket between the housing subassembly 6 and the connection plate 30 since the bond has the advantage of constituting a gas-tight connection. A further possibility for a permanent joint is one in which the connection plate 30 is in the form of a sort of inlay embedded in the material of the housing and at least partly surrounded by it. Embedding may be conveniently undertaken during the course of manufacture insofar as the connection plate is placed in the casting mold so that the synthetic resin is then cast around it (or molded around it, if a molding process is used in place of a casting method).

A detachable connection between the connection plate 30 and the housing subassembly 6 offers the useful effect that it is then possible for the connection plate to be rapidly replaced, as for example when the fluid power lines to be connected have connection spigots whose threads are not the same as the connection threads 31 of the connection plate 30. By simple exchange it is then possible to mount a connection plate 30 on the housing subassembly 6 which has suitable, matching holes and connection threads. At any rate it is in this case conveniently possible to have one or more gaskets 36 between the connection plate 30 and the housing subassembly 6, such gaskets then preventing leakage of the fluid power medium between the outlet orifices 26 and 27 and the connection holes 32.

In the working example of the invention described with reference to Figs. 1 and 2 the connection plate 30 is screwed to the housing subassembly 6. For this purpose the connec-

tion plate 30 has assembly holes (not shown) aligned with tapped holes (not shown) drilled into the housing subassembly 6 from the longitudinal side 24. Mounting screws 37 are present which fit into the mounting holes and are screwed into the matching tapped holes so that the connection plate 30 is clamped on the housing subassembly 6. It is convenient if the mounting screw 37 are allen head screws countersunk into the plate face 38 remote from the housing subassembly. It is particularly convenient if, as indicated in Fig. 1, the connection plate 30 is located by means of four mounting screws 37 which are in the corner parts of the plate face 38 which is preferably rectangular. In this respect the manufacture of the connection plate 30 will be particularly simple and convenient if the mounting holes for the mounting screws 37 are also respectively placed to be aligned with the connection hole rows 34 and 35. In this case it is possible to produce both the connection holes 32, and also the mounting holes for the mounting screws 37 in the connection plate 30, in a single working step, and then it will only be necessary to tap the connection holes 32 as marked at 31.

To provide a seal between the housing subassembly 6 and the connection plate 30 in the working example of Figs. 1 and 2 the gasket 36 is in the form of a sealing tape 41 which is furnished with communicating orifices 42 corresponding to the arrangement of the outlet orifices 26 and 27 and, respectively, the connection holes 32. Then in accordance with Fig. 2 each of the sockets 10 is connected with the surroundings, on the one hand via a controlled duct 23, a passage orifice 42 and a connection hole 32, and on the other hand via a controlled duct 23, a passage orifice 42 and a connection 32. The respectively cooperating controlled ducts, passage orifices and connection holes are coaxial to each other.

In order to design the arrangement of the invention with compact dimensions and a pleasing external appearance and also to locate the connection plate 30 in the position in which it is mounted on the housing subassembly 6, the connection plate 30 is let into the longitudinal side 24 of the housing subassembly 6 in the form of a rectangular prism so that the outwardly facing side 38 of the plate 30 is generally flush with the adjacent outer face 43. To make this possible there is a longitudinal groove 44 of rectangular cross section complementary to the outside of the connection plate 30 machined into the housing subassembly 6 from the longitudinal side 24 thereof. Accordingly despite the mounting of the connection plate 30 on it, the housing subassembly 6 still has a rectangular outline, the longitudinal axes 15 of the sockets 10 running parallel to the plane of the connection plate 30.

In what follows an account will be given of a further working example of the invention on the basis of Figs. 3 and 4. This construction may generally have the same configuration as described with reference to Figs. 1 and 2 and the main departure is centered on a further possible form of the detachable connection between the connection plate 30 and the housing subassembly 6. In the embodiment in accordance with Figs. 3 and 4 the connection plate 30 is detachably plugged on the housing subassembly 6. The means forming the plug connection may with advantage be the gasket 36 itself.

On the basis of Fig. 3 attention will be given, by way of example only, to the gasket 36 placed between the controlled duct 23 adjacent to the top side 9 and the connection hole 32 associated therewith. This gasket possesses two coaxially placed and integrally formed, generally hollow cylindrical gasket sleeves 45 and 46 with the same dimensions. These sleeves have a common coaxial through duct 47. One of the gasket sleeves 45 is plugged through the outlet orifice 27 into the controlled duct 23, whereas the other gasket sleeve 46 is plugged from the adjacent plate surface 48 into the connection hole 32. The gasket sleeves 45 and 46 consist of a material with elastic properties like rubber adapted to produce a sealing action.

It is convenient if both the controlled duct 23 and also the connection hole 32 are provided with a flared or widened part 49 into which the gasket sleeves may be plugged. Accordingly it is possible for the gasket sleeves to have a greater external diameter than the ducts or holes that are to be connected together, whereas the duct 47 may have a diameter which is identical to the diameter of the controlled duct and of the connection hole. Consequently unimpeded flow of the fluid is possible.

The design is such that each gasket sleeve 45 and 46 has annular retainer bead 50 on its outer face to snap into a complementary retainer groove 51 in the bore of the widened part 49 of the respective controlled ducts 22 and 23 and of the connection holes 32. The retainer bead 50 and the retainer groove 51 are in this arrangement so placed that they only cooperate when the gasket sleeves have been fully inserted into the respective widened parts 49.

Each mutually adjacent pair made up of a controlled duct and a connection hole is connected together via the gasket 36 as described with reference to Fig. 3 so that there is both a sealing off of the fluid passageway and also a firm mechanical connection between the housing subassembly 6 and the connection plate 30. Even if there is a high working pressure in individual fluid power ducts the connection plate 30 will not come clear of the housing subassembly 6 and be-

tween the retainer beads and the retainer grooves there are firm interlocking connections.

In order to rationalize fitting the gaskets 36 it is an advantage if a set of the gaskets is joined together, as is illustrated in Fig. 4. The separate gasket sleeves 45 and 46 are therefore molded on the two sides of a sealing plate 52 to be seen in Fig. 3 so that the sleeves project coaxially from the two sides thereof, the gasket plate having through orifices 53 placed coaxially in relation to the passages 47. The gasket extends in the longitudinal direction of the rows 34 and 35 of the respectively opposite pairs of gasket sleeves, which are consecutively placed along the length direction of the plate with spacings between them. The distance between the separate gasket sleeves are the same as the distances between the separate connection holes of a row of holes 34 and 35. In this respect it is convenient if there are longitudinal grooves in the plate surface 48 so as to be complementary to the gasket plates, and the plates take up a position within the connection plate 30 and it is possible to ensure that the plate surface 48 is able to abut the adjacent surface of the housing subassembly 6.

It will be apparent that the gaskets 36 may be grouped together in different arrangements and in the present working example it would be feasible to connect two gasket plates 52 integrally so that all the necessary gasket sleeves would be integral (not shown).

Fig. 5 illustrates a further embodiment of the array of the invention in which the feed duct 13 is located in the housing so that it extends from its orifice 16 on the housing side 24 having the outlet orifices 26 and 27 of the controlled ducts. In such a case the feed duct orifice 16 is aligned with a further connection through hole 54 in the connection plate 30. In this design it is possible to do without a separate tapped busing at the orifice 16 since the connection hole 54 has a connection thread. It will be clear that the type of sealing means between the connection hole 54 and the feed duct 13 is akin to the connection between the controlled ducts and the connection holes 32.

Dependent on the specific application of the arrangement in accordance with the invention it is also possible to have outlet orifices on more than one side of the housing subassembly 6, each such side then having a connection plate 30 (not shown). This is more particularly appropriate if the respective sections 8 are multi-way valves having a large number of input and output lines. In the present working example as in Fig. 1 the separate sections 8 may more particularly be the housings of 4/2-way valves.

It will furthermore be clear that each socket 11 may be in communication with an air venting duct 55 if the same is not integrated in

the valve components to be placed in the sockets. Each venting duct may be connected with a separate or common muffler or be able to be connected with manifolds for passing the spent air to desired locations.

It is to be noted that in the arrangement of the invention the configuration of the housing subassemblies 6 is naturally not limited to the form of a rectangular prism and any design would be possible such that a connection plate might be mounted thereon, for example with the use of a groove machined into the material. However the illustrated form has been found to be particularly convenient since it has a small overall size. The arrangement in keeping with the invention in fact constitutes an assembly made up of several, in the present case four, essentially block-like or cubic valve housings joined together in a row.

One notable advantage of the invention is that owing to the production of a single assembly a set of valve housings may be created which, if they were to be produced separately, would involve much higher labor and other costs. Since the assembly is made of synthetic resin material the internal ducts may have any desired form in accordance with requirements. The assembly in accordance with the invention may be in the form of a casting, the ducts, orifices and holes being planned for and produced in the course of the casting operation so that machining operations on the casting are reduced to a minimum. Furthermore the fitting in place of the array in keeping with the invention may be undertaken very much more rapidly than would be the case with a number of separate valve housings.

It is an advantage if the separate connection holes 32 and connection threads 31 of the connection plate 30 have different diameters or types of threads so that there is the possibility of fitting fluid power lines with different connection sleeves of various different sizes on the housing subassembly 6.

In accordance with a preferred form of the invention, not shown, the controlled ducts may be respectively duplicated so that one of each of such double ducts opens on one side of the housing and the other on the other side thereof. Each side of the housing then has a connection plate with connection bolts, the connection holes of the two connection plates having different diameters or types of thread, although the connection holes of each of the two plates have the same diameter or the same types of thread. Dependent on whether the one or the other double connection hole is used, the one or the other connection holes is shut off with plug or the like. There is then the useful effect that in the interests of rationalized production the housing subassembly is provided with different standard threads (as for example NPT and BSP threads, i.e. conical threads) so that the complex pro-

duction of two valve sides is not necessary and furthermore on delivery of the housing subassemblies there is no chance of confusion between valve housings with different types of screw thread, since each housing subassembly has facilities for both forms of standard thread. Confusion leads in some cases to difficulties in connection with stockholding.

75 CLAIMS

1. A valve housing arrangement comprising a set of valve housings combined together as a functional unit, each housing having a socket for at least one valve component, a feed duct and at least one controlled fluid duct for fluid whose flow is to be controlled in said housing, each of the ducts extending at least partly through the respective valve housing and opening into at least one of the sockets and having an orifice in an outer face of the arrangement for connection with external means, said valve housing being formed of synthetic resin with the set of housings combined together as a block-like housing subassembly and at least some of the orifices of the said controlled fluid ducts being arranged on a common side of said subassembly, the latter further including a connection plate extending over said common side and having tapped connection orifices coaxially aligned with said duct orifices in said common side.

2. An arrangement as claimed in claim 1 comprising a metallic tapped bushing mounted in an orifice of said feed duct.

3. An arrangement as claimed in claim 1 or claim 2 comprising a single such feed duct which is connected with all the sockets.

4. An arrangement as claimed in any of claims 1 to 3 wherein said feed duct is connected with all sockets and has an orifice in said common side.

5. An arrangement as claimed in claim 4 wherein said feed duct orifice in said common side is directed into a coaxial connection orifice in said connection plate on said common side.

6. An arrangement as claimed in any of the preceding claims wherein said connection plate is connected to said housing subassembly permanently.

7. An arrangement as claimed in claim 6 wherein said connection plate is bonded to said common side.

8. An arrangement as claimed in any one of claims 1 to 5 wherein said connection plate is detachably secured to said common side.

9. An arrangement as claimed in any one preceding claim comprising screw means connecting said connection plate with said subassembly.

10. An arrangement as claimed in any one of claims 1 to 8, comprising plug means forming a detachable connection between said connection plate and said subassembly.

11. An arrangement as claimed in any one

preceding claim comprising gasket means between said connection plate and the common side to confine flow of fluid to said coaxially placed orifices in said common side and in said housing.

12. An arrangement as claimed in any one of claims 1 to 10 comprising gasket means between said connection plate and said subassembly for confining flow between said controlled fluid orifices and said orifices in said connection plate coaxial to said controlled fluid orifices, said gasket means comprising a plurality of gasket members each made up of two elastomeric gasket sleeves, which are coaxial to each other, defining a common duct therethrough, said two sleeves being adapted to be sealingly inserted in said coaxially placed orifices in said plate and in said common side.

13. An arrangement as claimed in claim 12 wherein each gasket member has annular beads on an outer surface thereof adapted to snap into annular grooves in parts of said connection plate and of said subassembly defining said coaxial orifices into which said sleeves are to be inserted.

14. An arrangement as claimed in claim 12 wherein said gasket means comprises a plate-like connecting part integrally joining said gasket members together so that the sleeves thereof project from opposite sides of said plate-like part in rows in an array corresponding to the location of said orifices in said common side and said connection plate.

15. An arrangement as claimed in claim 14 wherein said rows are aligned with the longitudinal direction of said plate-like part.

16. An arrangement as claimed in claim 15 wherein said orifices in said plate are arranged in two such rows which are parallel to each other and extend in the longitudinal direction of said plate.

17. An arrangement as claimed in any of the preceding claims wherein said housing subassembly is in the form of a rectangular prism.

18. An arrangement as claimed in any one preceding claim wherein said common side of said subassembly is a longitudinal side thereof and said connection plate is let into this side so as to be parallel thereto, said connection plate having an outer face which is essentially coplanar with a part of said common side clear of said connection plate.

19. An arrangement as claimed in any of claims 1 to 3 wherein said feed duct extends in the longitudinal direction of said subassembly and has its orifice in an end of same and connects the sockets with each other.

20. An arrangement as claimed in any one preceding claim wherein said sockets open in a longitudinal side of said subassembly adjacent said common side and are arranged in a row extending in the longitudinal direction of the subassembly so that axes of the sockets are parallel to the plane of the connection

plate.

21. An arrangement as claimed in any one preceding claim wherein said housing subassembly is fashioned of cast synthetic resin and said connection plate of metal is conveniently embedded therein.

22. An arrangement as claimed in any one preceding claim comprising at least two of the connection plates mounted on respective sides of the subassembly each with a plurality of controlled fluid duct orifices therein.

23. An arrangement as claimed in any one preceding claim wherein said housing subassembly is made up of four integrally joined essentially rectangular valve housings placed in a row.

24. An arrangement as claimed in any one preceding claim having individual venting ducts connected with each of the sockets, said venting ducts extending through said housing subassembly and opening into the surroundings and having an outlet orifice connected with a muffler or a manifold.

25. An arrangement as claimed in any one preceding claim wherein the orifices in said connection plate selectively have at least two types of female screw threads therein.

26. An arrangement as claimed in claim 25, when dependent on claim 22, wherein a first one of said at least two connection plates has tapped orifices with the same diameter and a second of said at least two connection plates has tapped orifices with the same diameter which is different to the diameter of the orifices in the said first plate.

27. A valve housing arrangement substantially as described hereinbefore with reference to Figs. 1 and 2 of the accompanying drawings.

28. A valve housing arrangement substantially as described hereinbefore with reference to Figs. 3 and 4 of the accompanying drawings.

29. A valve housing arrangement substantially as described hereinbefore with reference to Fig. 5 of the accompanying drawings.

30. Any novel subject matter or combination including novel subject matter disclosed in the foregoing specification or claims and/or shown in the drawings, whether or not within the scope of or relating to the same invention as any of the preceding claims.

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